Part V. Summary and Conclusions

SAFE ADPE Procurement Issue:

Value of Compatibility with Existing ODP Hardware/Software

This study has attempted to evaluate the impact of a non-compatible SAFE architecture on the functioning of the Office of Data Processing. By non-compatible, it is meant a mainframe architecture other than the current ODP architecture used in the Ruffing and Special Centers: this architecture happens to be IBM, but this is not relevant to the study conclusions. We have in fact addressed the general problem of the value of a common ODP architecture.

SAFE will be a large complex system that will have a significant impact on ODP. We have attempted to isolate the additional impact that would occur if the SAFE hardware/software were not compatible with existing ODP Processing resources. This impact, as often as possible, has been expressed in terms of dollar cost and an effort has been made to minimize the qualitative assessment required.

Complex problems can rarely be treated in quantitative term exclusively and this problem is no exception. Cost has been used because it is the only readily understandable common denominator among a multiplicity of different categories where it is judged that ODP will feel an impact. This impact may take the form of an increase in direct cost (such as for training) or the loss of a capability (such as disaster backup).

For the latter type, cost serves to bound the impact and improve understanding. The use of cost allows total impact to be estimated through aggregating the costs (with some qualitative factors still remaining). The resultant aggregate cost (and aggregate impact) can then be "folded-in" to proposal evaluation to aid in the selection of SAFE ADPE.

It is interesting to speculate as to why there is an impact associated with a non-compatible architecture. In terms of the model used in this study, a non-compatible SAFE creates a "barrier" within ODP. The basic task of ODP is to apply office resources to ADP problems (i.e., the workload). The architecture barrier, however, impedes the transfer of these resources. In addition, the barrier also impedes the alternative to the transfer of resources to workload: the transfer of workload, or load sharing. To cross this architecture barrier with workload or resources implies an additional cost and, if this transfer is precluded, a loss of capability as compared to a homogeneous architecture environment.

The summary sheet lists the general resource/workload category and details the specific impact and estimated cost of non-compatibility. The estimated aggregate cost of non-compatibility (ignoring qualitative factors) is $6030K (in undiscounted 1979 dollars) over the seven year systems life of the CIA SAFE configuration. There is obviously a large amount of uncertainty in a study of this type. Due to this

uncertainty, it is reasonable to place a range of + 50% around the aggregate cost impact: i.e., $3015K to $9045K. The majority of this cost (i.e., 68%) is in the Increased Personnel Requirements category (Cost Element B-3) and represents the systems life cost of 13 additional people, 6 of whom are systems programming personnel supporting a new operating system.

To put this result in perspective, the systems life cost of the CIA/DIA SAFE IOC configuration (excluding workstations

[redacted]

DIA SAFE IOC configuration systems life cost and is not an insignificant impact.

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TABLE III

Summary Sheet: Cost of Non-Compatibility with Existing ODP Hardware/Software

Resource/Workload Category	Impact (Cost Element No)	Estimated Cost of Non-Compatibility* (Undiscounted 1979 $)
A. Management Expertise	A-1: Increased Management Complexity and Program Risk	**
B. People	B-1: Impact on Personnel Management	**
	B-2: Increased Vendor System Training	440K
	B-3: Additional Personnel Requirements	4090K
C. Hardware/Software	C-1: Limitations on Reconfiguration & Reutilization	490K
	C-2: Unavailability of Emergency and Limited Disaster Hardware Backup	40K
	C-3: Consolidated Procurement	***
	C-4: Software Exchange Limitations	470K

(Continued)

*Costs are over seven year systems life of CIA SAFE IOC configuration (undiscounted), rounded to nearest $10K.

**Qualitative factor, see cost element for further discussion.

***No cost impact or impact can be evaluated directly in procurement, see cost element for further discussion.

TABLE III

Summary Sheet: Cost of Non-Compatibility with Existing ODP Hardware/Software (con't)

Resource/Workload Category	Impact (Cost Element No.)	Estimated Cost of non-Compatibility* (Undiscounted 1979 $)
D. Workload	D: Technical Barriers to Load Sharing (see following)	-
	D-1: Routine Production Load Sharing	***
	D-2: Routine Development Load Sharing	***
	D-3: Backup Load Sharing (see following)	-
	D-3(a): Overflow Load Sharing	250K
	D-3(b): Disaster Backup	250K
		$6030K

*Costs are over seven year systems life of CIA SAFE IOC configuration (undiscounted), rounded to nearest $10K.

**Qualitative factor, see cost element for further discussion.

***No cost impact or impact can be evaluated directly in procurement.

Part VI. References

1. Consolidated SAFE Requirements Document, Volume I, CIA Operational and Performance Requirements, April 1979, STATINTL SAF-D0005X/79, (OUO).

2. MF, D/CSPO, [redacted] C/SA/CSPO/ODP, subject Study of Consolidated SAFE versus Separate DIA and CIA Systems, STATINTL dated 21 May 1978, SAF-E096-79.

3. MFR from [redacted] C/PPAC/CSPO. Subject: SPS/ODP Staffing Increase, dated 13 July 1979. STATINTL

STATINTL 4. a) [redacted] SAFE Proposal, Vol. I, "Executive Summary Technical" dated 15 January 1979, (SAFE-[redacted]002-3/79).

STATINTL b) [redacted] SAFE Proposal, Vol. II, "Cost" dated 16 March 1979 STATINTL (SAFE-[redacted]002-3/79).

5. C.E. Walston and C.P. Felix, "A Method of Programming Measurement and Estimation," IBM System Journal, Vol. 16, No. 1, 1977, reprinted in the IEEC COMPSAC 77 Tutorial on Quantitative Management: Software Cost Estimating, 1977, pages 269-288.

Part VII: Notes on Terminology

An attempt is made to clarify the meaning and intent of certain significant terminology used in this study. No claim is made that either the terms or their usage are conventional.

Compatibility

An H/S Compatible SAFE refers to SAFE hardware and software (H/S) that is compatible with ODP Ruffing and Special Center H/S. This is equivalent to saying that SAFE hardware is IBM or IBM plug-compatible and SAFE system software is ODP-supported IBM system software, either MVS or VM. Other terms used interchangeably for H/S compatible are IBM-compatible or IBM architecture.

A Non-Compatible SAFE, Non-Compatible Architecture or just Non-Compatibility as used herein, refers to a SAFE system that uses neither IBM or IBM plug-compatible hardware. (The situation of IBM or IBM plug-compatible hardware but non-ODP-supported system software is not evaluated in this study.)

Part II, "Introduction" discusses the compatibility situation in more detail.

Organizations

ODP Processing refers to CIA/DDA/ODP/DD/P current organizational components and/or the computer centers currently managed by them: i.e., the Ruffing and Special Centers.

SAFE Operations Group refers to personnel (staff or contractors) primarily assigned to SAFE support post- Initial Operational Capability (IOC). SAFE Operations Group staff are not necessarily slotted in ODP or a unique organizational component in ODP (e.g., an NFAC database administrator or an ODP Processing individual whose primary function is SAFE support.)

Costs (1979 Dollars)

All dollar figures, unless otherwise noted, are in terms of 1979 dollars with no escalation for inflation (i.e., constant 1979 dollars). (For convenience, FY-79 dollars are assumed equivalent to 1979 dollars.)

Evaluated Cost is a present value cost (i.e., discounted at 10% annually). Evaluated costs have not been developed at this time. All costs are in 1979 dollars.